

# ClearGain® Ground-Mounted Amplifiers



As mobile usage continues to increase, service providers are faced with the challenge of optimizing and expanding their wireless networks to provide new and existing services. ADC's ClearGain® Ground-Mounted Amplifiers (GMAs) minimize the cost of network expansion and improve quality of service, allowing service providers to increase profitability from new and existing services. ClearGain GMAs improve signal quality by boosting the uplink signal of a mobile system to increase receiver performance and improve overall coverage.

## Features

- Slim, stackable design conserves rack space and eliminates tower climbs
- Advanced filtering maintains the lowest possible noise figure for improved Quality of Service (QoS)
- Highly advanced LNA amplifies RX signal for improved receiver performance and increase in coverage
- Dual duplex feature reduces the number of feeder cable runs by providing simultaneous operation of TX and RX with low TX loss
- Modular system is fully compatible with all base stations
- Power and alarming for up to three GMA units

SPEC SHEET



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# ClearGain® Ground-Mounted Amplifiers

## Introduction

Unacceptable network quality is one of the main reasons for mobile subscriber churn. With increasing industry churn rates, a service provider's entire customer base could be lost in as few as three years. The cost of acquiring new subscribers to replace the existing customer base can be enormous. Improvements in quality of service can directly impact a service provider's profitability through the cost savings associated with increased subscriber retention and the additional revenue gained from increased billable minutes of use resulting from improved signal quality.

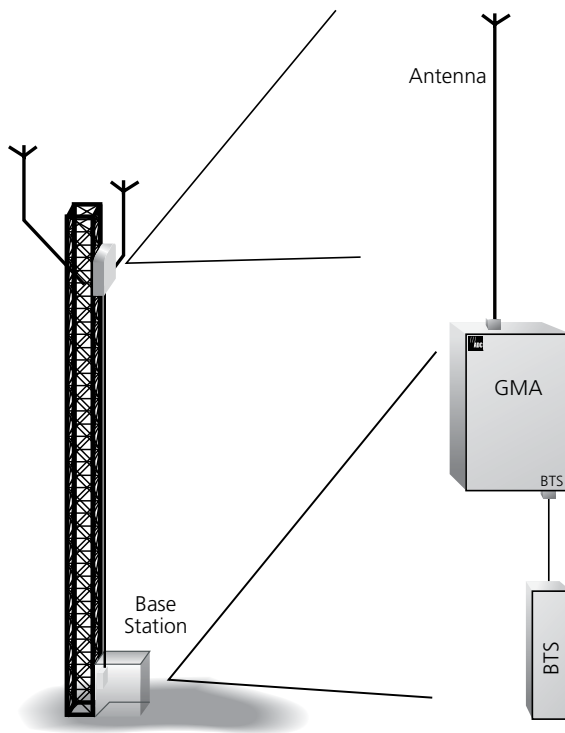
While subscribers are willing to pay a premium for data services, improved QoS is necessary to provide new data services. Due to the tradeoff between bit rate and bandwidth inherent to data services, improved signal quality is required to achieve the same level of performance at even higher data rates. ADC's ClearGain GMAs help provide this improvement in signal quality.

ClearGain GMAs improve signal quality by boosting the uplink (RX) signal of a mobile system. GMAs perform this amplification with the lowest possible noise contribution, resulting in a substantial increase in receiver performance and an improvement in overall coverage. These improvements in QoS allow mobile subscribers to place more calls, make longer calls, and successfully complete calls in an expanded geographic area, resulting in increased revenue.

## System Overview

The ClearGain GMA system is modular, consisting of an amplification module and a power distribution unit (PDU), providing full compatibility with all base stations.

The ClearGain GMA offers dual duplex operation and incorporates a highly advanced fixed-gain, low-noise amplifier (LNA) and high-performance filters for added reliability.





# ClearGain® Ground-Mounted Amplifiers

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## DD800 Full Band GMA Typical Specifications

### ELECTRICAL

Nominal Impedance of RF Inputs and Outputs:	50 Ohm
Frequency Range	
TX:	869-894 MHz
RX:	824-849 MHz
Passband (RX)	
Gain:	12 dB
Noise Figure:	1.4 dB
Dynamic Range	
Input at 1 dB Gain Compression:	0 dBm
IIP3:	+13 dBm
Insertion Loss TX Path (TX to ANT):	.4 dB
851 MHz Rejection:	<30 dB
Bypass Insertion Loss:	2.0 dB
Isolation in Tx Path:	80 dB
Rejection 1850-1998 MHz:	80 dB
Max Input Power:	+10 dBm
Passband Return Loss	
TX Band:	>18 dB
RX Band:	>18 dB
Intermodulation:	-120 dBm
Maximum Input Power (RMS Power):	500 W
TX Filter Rejection in RX Band:	40 dB

### POWER

Operational Voltage:	7 to 18 Vdc
Operational Current:	140 ± 10 mA
Alarm Current Level:	350 ± 10 mA

### PHYSICAL (Three Sector Site with Diversity)

Dimensions (HxWxD):	3.5 in x 19 in x 12.5 in
Weight:	22 lbs.

### CONNECTORS

Antenna Connector:	7/16 DIN female
BTS Connector:	7/16 DIN female

### ENVIRONMENTAL

Operating Temperature:	-40°C to 60°C
Lightning Protection:	IEC 61000-4-5
Vibration	
Storage:	ETS3019-1-1
Transport:	ETS3019-1-2
Operation:	ETS3019-1-3

### REGULATORY

EMC:	ETS300 342-2
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### APPROVALS

FCC:	Part 15, Class A
UL:	1950

### QUALITY

MTBF:	900,000 hours
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# ClearGain® Ground-Mounted Amplifiers

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## DD1900 Full Band Typical Specifications

### ELECTRICAL

Nominal Impedance of RF Inputs and Outputs:	50 Ohm
Frequency Range	
TX:	1930-1990 MHz
RX:	1850-1910 MHz
Passband (RX)	
Gain:	13 dB
Noise Figure:	1.0 dB
Dynamic Range	
Input at 1 dB Gain Compression:	+3 dBm
IIP3:	+15 dBm
Insertion Loss TX Path (TX to ANT):	.4 dB
1915 MHz Rejection:	<15 dB
1916 MHz Rejection:	<30 dB
Isolation in Tx Path:	80 dB
Rejection 824-894 MHz:	80 dB
Max Input Power:	+10 dBm
Passband Return Loss	
TX Band:	>18 dB
RX Band:	>18 dB
Intermodulation:	-120 dBm
Maximum Input Power (RMS Power):	250 W
TX Filter Rejection in RX Band:	40 dB

### POWER

Operational Voltage:	7 to 20 Vdc
Operational Current:	140 ± 10 mA
Alarm Current Level:	350 ± 20 mA

### PHYSICAL (Three Sector Site with Diversity)

Dimensions (HxWxD):	12.25 in x 19 in x 12.5 in
Weight:	80 lbs.

### CONNECTORS

Antenna Connector:	7/16 DIN female
BTS Connector:	7/16 DIN female

### ENVIRONMENTAL

Operating Temperature:	-40°C to 60°C
Lightning Protection:	IEC 61000-4-5
Vibration	
Storage:	ETS3019-1-1
Transport:	ETS3019-1-2
Operation:	ETS3019-1-3

### REGULATORY

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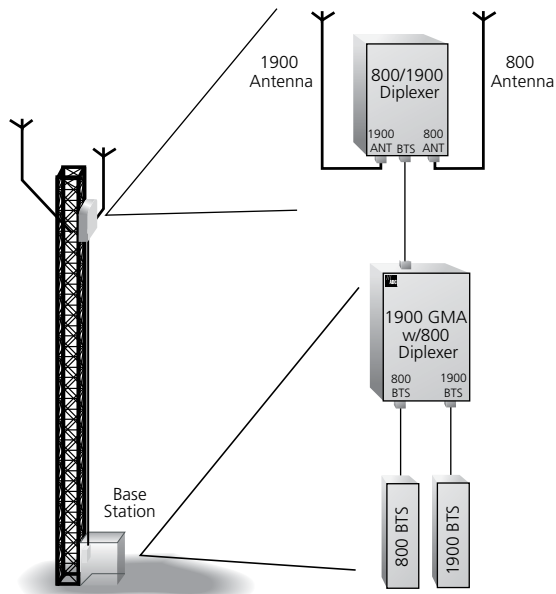


# ClearGain® Ground-Mounted Amplifiers

## DD1900 Full Band with DD800 Diplexer

The DD1900 Full Band with DD800 Diplexer GMA amplifies the full 1900 MHz band to maximize signal quality and optimize coverage while passing through the 800 MHz band without amplification. This allows the 1900 MHz system to be amplified without affecting the existing 800 MHz system.

The ClearGain DD1900 Full Band with DD800 Diplexer GMA features a slim, modular system that can be used in a three sector BTS or an Omni BTS. The amplification module is only 2RU high. Therefore, an entire GMA configured for a three-sector BTS will only take up 7RU in a 19" rack.





# ClearGain® Ground-Mounted Amplifiers

## DD1900 Full Band with DD800 Diplexer Typical Specifications

### ELECTRICAL

Nominal Impedance of RF Inputs and Outputs:	50 Ohm
Frequency Range	
TX:	1930-1990 MHz
RX:	1850-1910 MHz

### Passband (RX)

Gain:	13 dB
Noise Figure:	1.0 dB
Dynamic Range	
Input at 1 dB Gain Compression:	+3 dBm
IIP3:	+15 dBm
Insertion Loss TX Path (TX to ANT):	.4 dB
1915 MHz Rejection:	<15 dB
1916 MHz Rejection:	<30 dB
Isolation in Tx Path:	80 dB
Rejection 824-894 MHz:	80 dB
Max Input Power:	+10 dBm

### Passband Return Loss

TX Band:	>18 dB
RX Band:	>18 dB
Intermodulation:	-120 dBm
Maximum Input Power (RMS Power):	250 W
TX Filter Rejection in RX Band:	40 dB

### POWER

Operational Voltage:	7 to 20 Vdc
Operational Current:	140 ± 10 mA
Alarm Current Level:	350 ± 20 mA

### PHYSICAL (Three Sector Site with Diversity)

Dimensions (HxWxD):	12.25 in x 19 in x 12.5 in
Weight:	80 lbs.

### CONNECTORS

Antenna Connector:	7/16 DIN female
BTS Connector:	7/16 DIN female

### ENVIRONMENTAL

Operating Temperature:	-40°C to 60°C
Lightning Protection:	IEC 61000-4-5

### VIBRATION

Storage:	ETS3019-1-1
Transport:	ETS3019-1-2
Operation:	ETS3019-1-3



# ClearGain® Ground-Mounted Amplifiers



## Power Distribution Unit

Time and space are important considerations when selecting and installing wireless components at base transceiver station sites. The simple, compact design of ADC's ClearGain® Power Distribution Unit (PDU) is intended to help service providers save both. From a compact unit that is easily mounted on a wall or a rack, ClearGain PDUs provide power and alarming for ADC's ground-mounted amplifiers.

### Features:

- Provides power and alarm functions for on-site monitoring of Ground Mount Amplifiers (GMAs)
- Wall- or rack-mountable to fit available space
- LED indicators for alarm functions
- Simple, compact design allows for easy installation and connections



# ClearGain® Ground-Mounted Amplifiers

## Power Distribution Unit Typical Specifications

### ELECTRICAL

<b>Input Voltage:</b>	20-56 Vdc positive/negative ground
<b>Output Voltage:</b>	18 Vdc each
<b>Maximum Current Drawn:</b>	3.8A

### PHYSICAL

<b>Dimensions (HxWxD):</b>	43 x 196 x 103 mm (1.69" x 7.72" x 4.06")
<b>Weight:</b>	<460 g
<b>Color:</b>	Silver

### CONNECTORS

<b>Output for GMAs:</b>	SMB, male (qty 6)
<b>Power Connector:</b>	4-pin male
<b>General Alarm Connector:</b>	3-pin male

### Indicators

<b>Singlemode PDU:</b>	Green OK/NOK LEDs
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### Red General Alarm LED

### Alarm output LEDs

Alarm output is isolated 3-pin relay connection  
Normally open and normally closed connection  
available

### ENVIRONMENT

<b>Storage:</b>	ETS3019-1-1
<b>Transport:</b>	ETS3019-1-2
<b>Operation:</b>	ETS3019-1-3
<b>Housing:</b>	IP40
<b>Temperature Range (Indoor Use):</b>	-20°C to +65°C (-4°F to +149°F)
<b>Lightning Protection:</b>	IEC 1000-4-5 EMC
<b>Approvals:</b>	UL

### QUALITY

MTBF 250,000 hours. Manufactured under  
ISO 9001 quality system

### ACCESSORIES

#### Basic Accessories:

Power supply cable (10 m), alarm cable  
(10 m), grounding cable (2 m) and wall  
mounting screws

#### Optional Accessories:

Mounting hardware for 19" rack mount





# ClearGain® Ground-Mounted Amplifiers

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## Ordering Information

Description	Catalog Number
<b>ClearGain Ground Mounted Amplifiers</b>	
800 Fullband	CG0800DD025DG00
1900 Fullband	CG1900DD060DG00
1900 Fullband GMA w/ 800 Diplexer	CG1900DD060DGBP
<b>ClearGain Power Distribution Unit</b>	
ClearGain Single Mode PDU, Includes power cable and grounding cable	CG-PDU-SMPWR
PDU Mounting Bracket	AUX-000076



# ClearGain® Ground-Mounted Amplifiers

## Creating a Bill of Materials

A typical site includes three components in various quantities.

### You have three GMA options:

- |                    |   |
|--------------------|---|
| 1. CG0800DD025DG00 | 800DD Fullband GMA                      |
| 2. CG1900DD060DG00 | 1900DD Fullband GMA                     |
| 3. CG1900DD060DGBP | 1900DD Fullband GMA w/ 800 MHz Diplexer |

- The GMAs include:
- Mounting hardware
  - Grounding lug

Ordering information: Order one per sector

### You have one PDU option:

- |                 |                  |
|-----------------|------------------|
| 1. CG-PDU-SMPWR | Single Power PDU |
|-----------------|------------------|

- The PDU includes:
- Mounting Hardware
  - Power Cable (length 10 meters)
  - Alarm Cable (length 10 meters)
  - Grounding Cable/strap (length 1.5 meters)

Ordering information: Order one per site

### You have one PDU mounting option:

- |               |  |
|---------------|--|
| 1. AUX-000076 | Mounting bracket for one single or dual mode PDU to a 19" rack |
|---------------|--|

Ordering information: Order one per site

### Optional Accessories:

- |  |                 |
|--|-----------------|
| GMA 23" Rack Brackets                      | EB-35P          |
| PDU 23" Rack Brackets                      | EB-17P          |
| Siemens Cabinet Mounting Bracket           | AUX-000084      |
| GMA Outdoor Enclosure                      | GC0000000000GEN |
| GMA Outdoor Enclosure Replacement Seal Kit | GC0000000000GRS |



## SPEC SHEET



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